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and forms of mountains. Nine chapters are devoted to glaciation and the attending phenomena.

The book is simply and, as a rule, interestingly written. It is well illustrated, largely by wood cuts, and by a few selected half tones, contains a suitable series of references at the end of each chapter, and ought to form an excellent reading book for beginning pupils in college geology.

Modern theory is well summarized, and certain of the debated but interesting problems of geology are considered adequately, giving the various points of view held by different authorities, and with an excellent summary. This is particularly true of the chapters devoted to glaciation and the story of Niagara.

The author, as is to be expected, because of his special interest has devoted considerable attention to the phenomena of earthquakes and to the effect of faults in the earth's crust. The book is an excellent reference volume for students or laymen who are interested in a simple outline of geology with no thought of becoming specialists in the field. The excellent line diagrams in many places add materially to the clearness of the context. The volume has been tested in class work and should prove its worth.

R. E. DODGE.

**Revue de Glaciologie**, No. 3 (Avril 1903–1er Janvier, 1907). Par Charles Rabot. 343 pp. Maps,\* ills. Mémoires de la Soc. Fribourgeoise des Sciences Naturelles: Géologie et Géographie, Vol. 5, 1909.

These extremely valuable digests by Prof. Rabot, begun in the *Annales du Club Alpin Français* in 1902 to cover the events of the preceding year, and continued as No. 2 in the following year, are now issued in the third number to cover the four years from 1903 to the beginning of 1907. The subject of oscillation of glacier fronts is, however, brought up only to July, 1906.

There is a decided advantage in covering in a single number the longer period, since this permits of a greater differentiation of subjects as well as of a more satisfactory correlation of the data. The first chapter of the new booklet is devoted to snow and the measurements of snowfall; the second gives a review of general works which treat of glaciers and especially their physics and dynamics; the third section is concerned with glacial geography and includes references to the exploration of glaciers in many lands; while the fourth and last section is devoted to the variations in the advance or retreat of glaciers from 1903 to July, 1906. A work of this character by an authority like Prof. Rabot is one which no student of glaciers should be without, and it is to be hoped that means will be found for the continuation of these valuable summaries.

WM. H. HOBBS.

## GENERAL

**Correspondence d'Alexandre de Humboldt avec François Arago** (1809–1853). Par Dr. E. T. Hamy. xvi and 377 pp. Ills., index. E. Guilmoto, Paris. 1908. 3 fr. 50.  $7\frac{1}{2} \times 4\frac{1}{2}$ .

Not one of the least meritorious achievements of the late Dr. E. T. Hamy has been the publication of correspondence between justly celebrated men of science of the past century. We have already reviewed in the *Bulletin* the collection of letters addressed by Humboldt to his friend and companion Bonpland, sent to the latter mostly while he was in a sort of "durance vile" in

\* Listed in *Bull.*, Vol. 44, April, 1912, under "Alaska" on p. 316 and under "France" and "Norway" on p. 319.

Paraguay, under the despotic rule of Francia. This volume contains Humboldt's letters to one who stood as near to him, if not nearer, than the French botanist—to one to whom he was attached through common interest in studies to which he was more closely linked. Moreover, Arago, residing at Paris, which, for Humboldt, was as much of a home as Berlin, lived much nearer than the mewed-up friend at Asuncion, and intercourse was more frequent and more easy and regular. In addition to their common interest in science, Humboldt was drawn to Arago also by the influence which the early part of the lives of both had exercised. While the former's political ideas were of a more temperate nature than those of Arago, he still remained always under the impression which the maxims of 1789 had very distinctly colored and, while by birth an aristocrat (as well as in manners), he upheld a theoretical liberalism that enabled him to maintain intimate relations with extremists without jeopardizing his relations to King and Court, to which he was attached both by tradition and circumstance.

The collection embraces the period indicated above. It contains 124 numbers, the last one dated March 14, 1853. Only 115 are addressed to Arago, and even the first two (from 1809 and 1814) are given in abstract, the originals being lost. The nine letters at the end are addressed to members of the family of the deceased astronomer, and to several of his friends. The style of the documents justifies an observation made to me by somebody, about the French works of Humboldt: "It is beautiful German, written in French."

While the letters show the greatest intimacy between the two great men and extend over nearly every field of human activity, it appears from them that Humboldt had imbibed the true spirit of diplomacy, which was very well expressed to me once by a friend, a distinguished and thoroughly trained Brazilian diplomat of high standing. He said: "To say what it is your duty to say, and not to tell what must not be told, is the sum and substance of diplomacy." Humboldt freely alludes to public affairs, to political matters, in his communications, but he never "tells" anything but what is or can be public. With his intimate relations with the Prussian monarchs, and the constant intercourse with his brother Wilhelm and other diplomats, Alexander had conceived the true methods of diplomatic intercourse. Hence the political side of his correspondence is clear of confidential indiscretions, and distinct from the private correspondence published many years ago. Varnhagen von Ense, to whom that correspondence was addressed, was a diplomat himself, and many points could be touched upon with him on public affairs, and were alluded to. Arago was astronomer and physicist, hence letters to him, while containing also talk which might be called gossip, bear always upon scientific matters, even when gossip enters into their composition. The correspondence with Varnhagen von Ense, while not harmful, should never have been published, or only after very careful scrutiny, which was not observed by its editor.

The scientific interest of this volume is considerable. It presents the progress of science in Europe for nearly half a century and during a time when physical and natural sciences obtained the impulse under which they are moving to-day. Almost every branch is represented, geography coming in for a large share. At the same time it shows with what close and constant attention Humboldt followed the labor of others in every country; what a large part he had in fostering and assisting their progress, and what a sympathetic interest he took in everything and everybody that deserved it. While himself a student of paramount activity and solidity of thought and action, he was at once a "pro-

moter" of the right sort, not a modern speculator upon the goods and means of kind souls who are mulcted for the benefit of enterprising schemers under the pretext of "advancement of science," for their personal benefit.

Humboldt had hardly any means of his own, since he sacrificed his patrimony for the South American exploration of 1799 to 1804, but he justly had the ear of wealthy patrons and made use of his position, not merely for himself, but for everyone he considered worthy of being sustained.

The correspondence is a chronicle of the development of scientific research, coupled with personal incidents making it additionally valuable in a biographical sense. And the man to whom it was addressed not only understood it thoroughly, but acted his part worthily in the same direction. There is nowhere a trace of jealousy, of covert disappointment at the discoveries of others. When political causes obstructed the path of Melloni, it was Humboldt who employed his standing with court and diplomacy to save him from distress; when young men loomed up in a manner showing prospective merit, and needful of protection in order to live and develop the resources of mind, he endeavored to find protectors for them, through his extensive acquaintance and great influence. Of all this the letters bear abundant testimony, without boasting, in a simple, perfectly natural manner, which shows that in helping others he thought only of performing a duty to science, by assisting its adepts. He follows with a keen interest every new step in physical science, aids in mathematical work, even at an advanced age, gives advice to those deserving it, but quite as often begs of his friend, not only opinions, but directions on many problems of research.

The letters abound in acknowledgements of gratitude to those who aided him in many ways. The King of Prussia deservedly heads the list. In the letters from eastern Russia the extraordinary munificence and valuable support, which the Imperial Russian government favored him with on his important journey to Central Asia, are duly acknowledged. If it should be true (Humboldt, in his correspondence with Varnhagen von Ense, treats it rather as a joke) that England opposed his intention of entering India, thus blocking his favorite purpose, then the deportment of Russia would be in highly favorable contrast with that of the British government. In the present volume Humboldt makes no mention of it. His allusions to English scientists are not frequent, but usually courteous.

The great intimacy between Humboldt and Arago causes the former to allude to contemporaries and collaborators without reserve. In such remarks he discriminates between the scientific capabilities and labors and the personality of the man. The former are usually treated from a standpoint that would be encouraging to the individual; personal character and peculiarities are often the subject of amusing and even caustic, observations. Humboldt, like everybody else, had his likes and dislikes, and in either case they may prove mistakes. Hence we refrain from mentioning names. But these personal allusions are not merely interesting, they are often quite valuable. Distinguished men, scientists for example, are mostly known from the outside so-to-say, from what is public about their achievements. Here we have, in a form that was only intended to be private and even confidential, a great number of notes and appreciations about contemporaries, by one who judged them from various points of view, and who stood on a level of independence that gives exceptional weight to his judgment about persons. It is often gossip, but never indifferent. We see, in these forty-four years of talk about events and people, the scientific world

of that period passed in review by one who was not a mere looker-on, but an active and very prominent participant; who knew what he was saying and the men of whom he spoke. Likes as well as dislikes are sometimes at fault, but are permitted as long as the motives are not unworthy. Of this, in the case of Humboldt, no trace can be found.

Impressions gathered in younger days are lasting and render sympathies and antipathies very durable. So the feeling of Humboldt for France and Paris, especially Paris, is marked to the last. While German in spirit and method of thought, he clings to French ideas and recollections with a sentimental tenacity, that is the result of the effusive type of feeling prevalent at the time when his career as explorer began. This effusiveness is equally marked in expressions of attachment and tenderness for his life-long friend. It is noteworthy and characteristic of Humboldt that it was not Arago that sought him but that it was he who, convinced of Arago's ability, made the first advances when the young astronomer was yet hardly known. Arago was seventeen years younger than Humboldt, and only twenty-three when the latter first wrote to him, at the age of forty.

The late Dr. Hamy, the editor, has increased the already great value of the book by his prefatory remarks and especially by the numerous biographical notes. They are, in fact, a brief biographical cyclopedia of such proper names as appear in the correspondence. The book as a whole does honor to the writer of the letters, to the man to whom they are addressed, and to its able and thoroughly informed editor.

AD. F. BANDELIER.

**Die Hauptsprachen unserer Zeit.** Mit einer Einleitung: "Die wichtigsten Sprachen der Vergangenheit" sowie mit zahlreichen Schrift und Sprachproben und einer Sprachenkarte von Dr. Ludwig Harald Schütz. ix and 226 pp. Ills., map, index. J. St. Goar, Frankfurt am Main. 1910. Mk. 6. 9½ x 6½.

The book contains short characteristics of the linguistic qualities, script, and literature, of the principal languages of the world. After an introductory chapter on the dead languages: Greek, Latin, Hebrew, Phœnician, Egyptian, Assyrian, Sanskrit, and the extinct Indian languages of Mexico, the author takes up the languages which are spoken to-day, in order of the number of people who use them. First, the languages of Eurasia: Chinese, English, Hindustani, German (inclusive of Dutch, Swedish, and Danish); the Slav languages; French, Japanese, Spanish, Malay, Italian, Turkish (including Hungarian), and Portuguese. The fact that the author associates Breton with French and the Basque dialect with Spanish, as well as the entire omission of Icelandic and Lithuanian, proves that his object was not to give a philologically safe division of his subject. African languages are divided into Semitic, Hamitic, Sudanese, Bantu, Hottentot-Bushman, and Hova; American languages into Eskimo and Indian (the latter illustrated by the example of the Dakota idiom) for North America, Nahuatl and Maya languages for Central America, and Tupi and Peruvian (Quichua) for South America. In Australia, several native dialects of Queensland, New South Wales, Victoria, West Australia and South Australia are briefly described, together with the languages of the Papuans of New Guinea and New Mecklenburg. A chapter on scientific, artistic, and artificial languages completes the array.

In the case of each of these languages, the alphabet, rules for pronunciation, principal characteristics of grammar and syntax, and examples from its litera-